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AUTHOR Little, Deborah
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ABSTRACT

Intended for teachers interested in integrating computers into a reading curriculum, this paper analyzes three computer adventure games and suggests applications of each game within the reading class. Beginning with definitions of the concepts of reading, comprehension, and adventure game, the paper then describes the three games: "Seastalker," "Mystery House," and "Jury Trial." The paper then discusses motivation, control, interaction, application, the text, and the graphics of the game, as well as further uses for the games. The paper concludes that adding carefully selected adventure games to the reading curriculum can help students to develop a commitment to reading and to become actively involved in reading selections. A list of references, including the software discussed in the paper, concludes the report. (EL)

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Adventure Games in the Reading Curriculum: Problems and Potential

Deborah Little

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Adventure Games and the Reading Curriculum:

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Adventure Games and the Reading Curriculum:

Problems and Potential

Introduction

This paper presents an analysis of three computer adventure games and some applications of each game for the reading curriculum. The paper is intended for teachers who want examples of how to integrate computers into a reading program. These computer adventure games were chosen as examples of creative commercial software that is not specifically designated as educational, not written for any special ability group or reading level, and not intended for any particular content area. I believe that such software illustrates that adventure games can be used to generate interest, increase student motivation, and build reading skills in much the same way as paperback books are often used in some reading programs.

Definitions

For the purpose of this paper three concepts must be defined: reading, comprehension, and adventure game. Recent research in reading has focused on schema theory; learners come into the reading environment with certain backgrounds which create individual frameworks of expectations (McNeil, 1984). Schema theory supports the definition of reading as a process in which the reader obtains meaning from print by interacting with words (Johnson and Pearson, 1984). Additionally, reading is a personal experience, one in which the reader makes meaning out of the text by interpreting visual signs (Rosenblatt, 1980).

Comprehension, as defined in most dictionaries, is understanding or grasping meaning. The dictionary definition oversimplifies the complexity involved in reading comprehension. For the purpose of a reading curriculum, comprehension is based on the following: word recognition; the ability to reason with words; literal understanding; the ability to identify an author's intent, make use of context clues for word meaning, pull details together, follow story organization/sequence, recognize literary devices, and identify the main idea (Davis, 1968). The reader is not necessarily aware of these individual elements involved in comprehension since many of them work together to create a personal reading experience. In that sense, it is the reader who "composes" the meaning of a selection, using a process similar to a writer who composes a meaningful composition (Tierney and Pearson, 1983). Also part of the definition of comprehension are the levels at which a reader may understand what is read: literal meaning, interpretation, and application (Scanlan, 1984).

An adventure game is defined here as a problem solving activity in which participants role-play characters, deduce commands, draw maps and determine a sequence of events. The setting may be historical, mythical or futuristic (Jarchow and Montgomery, 1985). An adventure game lets readers interact with the text presented on the computer screen; it is an activity that requires both reading and comprehension if the participants are to experience success. Additionally, an adventure game may conclude at different times and in different ways for each individual pursuing the adventure.

Descriptions of Three Adventure Games

The brief descriptions here form the basis for the analysis that follows. The reader might wish to keep these descriptions handy for later referal.

Mystery House is one of the first adventure games (1980) developed by Sierra On-Line, Inc. In this game, the player must solve a murder mystery by discovering the answers to the following: Who is the killer? What are the motives? Where does the secret passage lead? Who is leaving the strange notes? Who is the next victim?

There is no written documentation to accompany the adventure, but the program disk does include a brief description of the adventure, some hints on playing, and a few messages about using the program disk. This game uses computer graphics to illustrate the house and the various rooms the player enters, and to help reveal important details about characters, rooms and messages that are necessary to solve the mystery. Mystery House accepts a maximum of two words at a time, usually a verb followed by a noun. In some instances, such as indicating a direction, the user may use one word - NORTH, SOUTH; or a single letter - N, S. Unfortunately, the limited vocabulary (about 30 words) for this adventure makes the game move slowly until the user gets accustomed to the allowable verbs and nouns.

A special feature of this game is the ability to SAVE a game and return to that place on another day with RESTORE GAME. Players do not have to restart the game from the initial play each time they want to play. The goal of the game is to eventually find the murderer, so the game should not be attempted

as a one time activity; this is probably the reason that the programmers included the SAVE/RESTORE GAME feature.

Seastalker is a more recent (1984) adventure game, produced by Infocom, Inc., a software company that has several computer adventure games at various levels of difficulty. This game is the first to be developed at the 'junior' level. The object is to save the Aquadome from a sea monster and discover who the traitor in the crew might be. Right from the beginning, this game becomes a personal challenge.

Seastalker includes written documentation, clue cards, maps, illustrations, and a subscription to an adventure game newspaper. The vocabulary for this adventure is 800 words, an added advantage over other adventure games. While interacting with the game, the user may type in entire sentences; however, the program is designed to scan for certain words, read only the first six letters of each word, and respond accordingly. This game is a text-only game, but the written documentation and other material that accompany the game more than compensate for the absence of any on-line illustrations.

Like Mystery House, Seastalker users may SAVE and RESTORE a game; for this game the STOREd game must be done on a separate diskette. The written documentation fully explains how to correctly SAVE and RESTORE so that the original game disk will not be accidentally destroyed. Another special feature of the Infocom game is SCRIPTing. If the players are using a computer that is attached to a printer, they may get an exact copy of the game as it is played. While this is an advantage for reviewing the strategies tried, or reviewing before beginning another

session, using the printer slows the game down considerably. (This may be a problem only with slower printers.)

The version of Jury Trial that was used for this paper does not include any written documentation or on-line instructions. It is intended for two players; the users interact in a cooperative manner to choose a jury, question witnesses, and convict or acquit the accused. The game consists of text only and requires the players to interact with limited responses, usually a single word, though at one point the witness must type in a a few sentences.

Although not marketed as an 'adventure game,' I include Jury Trial in this classification because it requires the users to role-play and solve a problem (crime), and it depends heavily upon the players' ability to read quickly and carefully, and to recall specific details (literal comprehension). In addition, Jury Trial can be completed in one session, a feature not found in the other games for this study. It is like a short story compared to Mystery House and Seastalker, which are more like novels or plays that require several sessions before completing the reading activity.

Analysis:

Motivation, Control, Interaction, Application

Each of the games chosen for this paper represents reading as previously defined. Students participating in an adventure game activity are engaged in a personal experience interacting with words. Of course, any reading involves a personal interaction; however, using adventure games in the reading curriculum has

greater motivational value because interaction is more personal: the reader inputs information which becomes a part of the story content. In the case of Mystery House for example, the reader must decide on the direction, open doors and cabinets, pick up notes, and examine walls to read what is not shown automatically. Sometimes, it takes several attempts to get into a room and find a particular clue. The player must read more than the obvious into the story in order to enjoy the maximum reading experience. Adventure games require the reader to use imagination and personal background along with the text to create the story sequence.

In a recent interview in Classroom Computer Learning, Judah Schwartz said "...computing makes little sense as a subject...it's supposed to help you think more clearly" (Brady and Levine, 1985). This statement illustrates the purpose of using computers as a tool in the reading curriculum. Using adventure games in the reading classroom provides opportunities for thinking clearly, since the user must make careful decisions while participating in the adventure.

Adventure games give the users/students control, allowing them to "lead the conversation" while the computer displays the consequences (Brady and Levine, 1985). Using computers and computer software might help more readers to become origin readers rather than pawns: readers who feel in control of what they are reading rather than controlled by what they are reading. Motivation to read is high when the reader is actively engaged in the text. Adventure games can provide students with active reading experiences.

The three games selected for this paper allow the users to control the action, while the computer reports results. In both Mystery House and Seastalker, when a poor decision (fatal to the sequence of events) is made, a game is terminated by an algorithm written into the program, prompting the computer to display a message explaining why the game is over. Unlike the other two, Jury Trial will continue until the game reaches the place where a judgment must be made of guilty or not.

Jury Trial may be played several times without getting the same crime or the same jury; however, it does not give the readers as much control as Mystery House or Seastalker. But this does not appear to be a limiting factor in using this game to increase student motivation in the reading curriculum. In fact, because the reader can complete Jury Trial in one session, motivation to play another game may be increased, especially for poorer readers.

Adventure games are like other games that people play. In spite of a game ending unsuccessfully, players tend to want to play the game over and over again. There seems to be no loss of interest in the game itself, or motivation to play the game again in the hopes of winning (Bright and Harvey, 1984).

One teacher who worked with Mystery House reported that student motivation and interest was high; students and teachers alike began to communicate with each other about how to get into special rooms or how to find necessary clues. Motivation and interest actually snowballed as users became more and more interested in solving the murder. This particular adventure game helped students plan a solution to a problem through interacting

with others. Students were engaged in the higher order cognitive skills of planning and revising to find a solution to a problem using feedback and new information (Linn and Stein, 1985).

Seastalker begins by having the users type in their first and last names; right away the motivation to continue is increased by making this a personal experience. The lab where the adventure begins is the last name of the player, and the player is asked to give commands for what should be done every step of the way. Every now and then the program responds to the commands using the first name of the player typed in when the game began; some descriptions and questions also address the user by name. This continued personal touch motivates the user to look carefully for a solution, reinforcing the notion that the reader has control over the story sequence.

Since the player can SAVE a game and later RESTORE that place, motivation to return to the interaction with the text may be increased. Unlike traditional reading material, when using computer adventure games readers cannot look ahead to see how the story might end. If readers want to find out how the story ends, they will have to return to the place they last read and continue reading/interacting; SAVE is the computer equivalent of a "bookmark." Because it is possible that no two readers will have the same story or "bookmark," having to use a separate disk to SAVE a game is an added advantage that Seastalker has over some games where an individual's game is saved on the game disk.

An additional motivating factor for reading Seastalker is the ease with which the player can review details of the setting. By simply typing in LOOK, the player can get an account of the

current surroundings. At that point, the reader can easily refer to the written documentation or clue cards for further assistance. This is similar to re-reading a section of a story in a traditional reading environment to recall some specific details.

A 1982 study reported that some students were disappointed in the low level of interaction they had when using computers to read. The reading activity they participated in involved more page turning than reader interaction (Edyburn, 1982). The three adventure games analyzed here probably would not create such a disappointment among users. Jury Trial, for example, requires the players to read quickly and carefully, especially when the details of the crime, the scene and the criminal are being described. These details flash on the screen completely controlled by the computer. The repeat user is acutely aware of the necessity for paying attention. In fact, it seems that this feature is a factor which might increase motivation for students once they realize the importance of knowing all the facts as they question witnesses and the accused to decide on the outcome of the trial. And, when the witness is asked to write an affidavit at one point in the game, remembering specific details is of great importance.

Seastalker requires the readers to interact minimally with the text on the screen, but if readers are to get the maximum benefit they must also read the written documentation, including a log book and clue cards. Both help the reader proceed through the adventure to save the Aquadome and learn who the traitor is. During the adventure, the player is occasionally instructed to

refer to a certain clue card for particular details. Additionally, if students use the SCRIPT option mentioned earlier, they have another source for reading, reviewing and interacting with written words. (See attached copy of a brief experiment of the SCRIPT option.) Seastalker makes an excellent case for reading as a personal interaction with written words.

Including Jury Trial in a reading activity requires two students to read the text together at the same computer terminal. Both players must read the text and respond to questions in order to bring the game (trial) to a conclusion. As mentioned earlier, this game calls for less user control than either Mystery House or Seastalker. In spite of the limited user control, readers interact with the text to choose the jury (no two juries have the same members), respond to questions during the 'trial,' and write an affidavit for the jury to examine.

Central to the reading activity is comprehension - understanding the text while reading/interacting. Jury Trial requires students to understand what is read literally and to pull together details about the suspect and the crime while responding to questions. In order for the readers to make accurate responses to the questions, they must also be able to reason with words. Even though this program does not have students type in sentence answers for every question, students must be able to reason out what is expected. The students' ability to reason with words is demonstrated when they type in a few sentences for the affidavit. This section also reveals whether or not students have followed the organization of the story and have understood the intent.

Mystery House allows for more user input from the keyboard and requires a thorough understanding of the text at the level of application. The players move around the house looking for clues, reading notes, and picking up items that might be needed later. When the time is appropriate, the readers must make the decision to apply information that has been gathered. For example, if the players have found the matches and the candle and picked up both items, they will be prepared to apply their knowledge about getting a light by using the matches and candle when the lights go out.

Seastalker also requires the readers to apply knowledge gained at the appropriate times throughout the adventure. The readers must use the tools gathered, refer to the log book, or use clues to make good decisions. Sometimes, the readers must even go a step farther and interpret details. For example, in the beginning of the adventure something causes the videophone to get fuzzy. There have been no clues as to why this would happen; it is up to the players to decide what must be done to correct the problem, possibly relying upon prior knowledge, and certainly interpreting what is expected to correct the problem. Some users may take several attempts to solve this problem; not everyone realizes that a simple solution would be to find the electric panel and look for a loose connection. But again here is a case for using adventure games to have students discuss solutions to problems with each other.

In Seastalker it is also important that the readers follow the story organization. In order to avoid backtracking, the readers need to remember what strategies have been attempted, and

avoid repeating steps. This is another instance where using the SCRIPT option would enhance the readers'comprehension, and provide a means for reviewing details.

Text and Graphics

An emerging issue in considering the value of computer software in reading programs is the presence or absence of graphics. Studies have been done which test whether reading comprehension is positively or negatively affected when graphics are included with text. As might be expected, some research shows children understand stories equally well with or without pictures, (Miller, W. cited in Edyburn, D.) and some research found negative effects on comprehension when graphics and text were mixed (Weintraub, S. cited in Edyburn, D.). Those findings are based on traditional reading materials; there has been little research in the area of computer graphics and reading comprehension.

One recent study which tested the effects of computer graphics on reading comprehension made the following assumptions: students reading stories on the computer using computer graphics would have higher rates of comprehension when compared to students using computer stories with no graphics; time to complete stories with graphics would not be significantly different than time to complete stories with no graphics; and students using computer stories that include graphics would show more favorable attitudes towards computers. There was a lack of significant results in the study which is consistent with the literature reporting studies of traditional materials and the

effects of graphics on reading comprehension. However, the researcher did observe that the presence of graphics seemed to have a positive influence on the students' attitudes towards computers (Edyburn, 1982).

One of the adventure games for this analysis, Mystery House includes text and graphics; Jury Trial has text only; Seastalker has text only, but includes written off-line documentation with a graphic representation of the lab and a map of the surrounding area. Even though research has not demonstrated that graphics have any special effect on the reader and reading comprehension, it appears that graphics can have some effect upon comprehension, especially if the graphics and text are on the same screen. Edyburn's study used text and graphics, but graphics and text were not seen together; students watched the computer draw the graphics onto the screen, then pressed a key to erase the screen and read the text associated with the illustration. This may account for the lack of significant results when students were tested for comprehension, and may also account for the greater length of time needed to complete the reading selection which included graphics (Edyburn, 1982). In a different setting, where graphics and text are seen together, it is possible that comprehension will be greater for students who read stories on the computer where the graphics appear at the same time as the text.

Mystery House mixes text and graphics on the same screen; the reader sees only four lines of text at a time, but can look back at previous text and responses if desired as explained in the brief instructions for the game. Having only four lines of text may be frustrating for the users until they get accustomed to moving back and forth between all text and text plus graphics. The graphics in Mystery House are simple line drawings, but these pictures are necessary. Without the graphics, it is impossible to see objects that need to be examined, read notes that appear in some rooms, or pick up special objects that might be useful. Readers' motivation and comprehension would probably be diminished without the graphics. In fact, if the adventure reader does not find the matches and candle early in the game, when it gets dark and there is no light the graphics disappear. This gives the effect of being in a dark house. If this happens, the user will be unable to find the murderer, will probably become a victim, and the game will end. Using adventure games which depend on the graphics as well as the text might teach students to pay attention to specific details and help build reading comprehension.

Seastalker, which has text only on the computer screen, can be used without referring to the written documentation; however, the enjoyment and understanding of what to do to proceed through the game successfully is probably increased if the user makes use of the off-line materials as the game is played. If readers want an additional challenge they may request SUPERBRIEF to receive only limited on-line description of their surroundings. This feature helps to build students' ability to infer. If that

proves to be too difficult, the user can return to getting more detailed descriptions by typing in VERBOSE.

Jury Trial is a text only game which requires the players to recall specific details in order answer questions correctly. Since there are no graphics depicting the crime, the players must read carefully when the screen displays the description of the scene of the crime, and pay careful attention when the description of the criminal and the getaway vehicle are flashed on the screen. This feature of Jury Trial may present problems for some readers, since the descriptions flash onto the screen at different locations and are visible for only a few seconds. However, this difficulty can be turned into an opportunity for the readers to increase their ability to read quickly and recall specific details.

Further uses of the Games

Many educators might at first think that adventure games have no place in the school, that games should stay in the arcades; however, some adventure games can provide students with opportunities to develop problem solving skills and organizational abilities as well as increase reading comprehension. Some teachers are even "convinced that language patterns surface during the exciting writing and speaking activities which follow naturally from the content of the games" (Jarchow and Montgomery, 1985).

In a reading class, teachers can have students keep a journal of their attempts to find the murderer in Mystery House. This activity would help students to organize details and

increase their ability to reason with words. Students can share their journals with others who are reading Mystery House and swap ideas about strategies or make suggestions to help each other. As Goodman and Goodman (1983) note, students learn to read not only by reading but also by writing.

Students using Seastalker might be assigned to keep a notebook of any unfamiliar words they encounter. They could be directed to follow this up by defining new/unfamiliar words, using a dictionary or context clues from the program if possible. The natural followup to defining the words is to use the words in sentences in a notebook, or if appropriate to use the word while continuing the adventure. Students might also use their lists of unfamiliar words to create crossword puzzles or other word games and trade games with classmates.

Students can be assigned to write a newspaper article describing the crime in Jury Trial. This could be developed into a class activity since there are several crimes to describe. A police report column could be written using several different students' accounts of crimes.

Conclusion

One of the biggest concerns being expressed today is that valuable time, energy, and money not be wasted implementing computer technology in inappropriate ways (Tashner, 1984). Since games are already commercially available, enjoyable to play, and adaptable to an educational setting, this concern need not continue to be a major problem. Again, this paper has illustrated that it is not necessary for teachers to only use

computer software designated for reading to build activities that help students become active readers. Adapting carefully selected adventure games to the reading curriculum can help students develop a commitment to reading, to see reading as something they help create, not something imposed upon them (Bettelheim, 1982).

Too often computer programs have flaws which teachers find disquieting. Some of those flaws are: too much text, too little interaction, too many irrelevant pictures, no individualization, long involved instructions, over emphasis on entertainment rather than education, too much page turning, and materials that do not hold the students attention (Bork, 1984). Using adventure games in the reading curriculum alleviates some of these problems of computers in the educational environment. Students and teachers alike become actively involved in reading selections by adapting a game into a meaningful activity.

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